

### DISCUSSION OF THE AMENDMENT

Claims 38 and 57 have been amended to require that the vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof. Support is found, for example, in original Claim 7.

New Claims 100-113 have been added, and are supported by original Claim 37.

New Claim 114 has been added, and is supported by Claim 58, prior to the above-discussed amendment to Claim 57.

No new matter is believed to have been added by the above amendment. Claims 38-114 are now pending in the application.

### REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the interview held April 16, 2002, in the above-identified application. During the interview, Applicants' attorney discussed the issues raised in the Office Action. The discussion is summarized and expanded upon below.

The rejections of Claims 38, 39, 41-47, 49-52, 57-63, 76, 77, 84, 87, 94, 98 and 99 under 35 U.S.C. §102(b) as clearly anticipated by, and of Claim 48, 79-83, 85, 86, 88 and 89 under 35 U.S.C. §103(a) as unpatentable over, the Science and the Glass Industry article of Koz'min et al, are respectfully traversed. Koz'min et al neither disclose nor otherwise suggest the claimed subject matter of present Claim 38, since Koz'min et al do not disclose the addition of combustible elements with or within the vitrifiable materials feeding the melting chamber. Koz'min et al also do not suggest that it is possible to add a combustible element in

the mass of the starting materials, in addition to or in replacement of the combustible feeding directly the submerged burner, like hydrogen, methane and light gaseous hydrocarbon compounds. The choice made according to Claim 38 is very advantageous for the whole glass industry. It makes it possible to feed the melting furnace with at least partly organic materials and glass/organic composite materials that were hard to recycle (like windshields or mineral wool with organic binder). This is possible only because the burners are submerged ones. Only those particular burners make it possible to bring the combustibles at their vicinity, below the bath of molten glass. Furthermore, as explained in the specification, the submerged burners generate a lot of convection movements within the bath of molten glass, which makes the permanent renewal of the combustible elements at their vicinity possible. This is very innovating and could not have been imagined with conventional melting furnaces (either those using immersed electrodes and called electrical furnaces or those using burners above the bath of molten glass and sometimes called gas furnaces). This is a completely new use of the technology of the submerged burners (recycling/valorization of composite/waste materials), which renders it more attractive.

The subject matter of Claim 57 is also patentable for the same reasons.

In the Office Action, the Examiner noted that the claims do not require combustible materials. In reply, it is now clear that the claims do require such materials.

For all of the above reasons, it is respectfully requested that the rejection over Koz'min et al be withdrawn.

The rejections under 35 U.S.C. §103(a) of Claims 53-55, 64, 65, 67, 70, 90 and 91 over Koz'min et al in view of U.S. 3,938,981 (St. John); and of Claims 56, 72 and 93 over Koz'min et al in view of U.S. 3,260,587 (Dolf et al); are respectfully traversed. St. John has

been relied on for a disclosure of refining molten glass. Dolf et al is relied on for a disclosure of submerged combustion methods and apparatus.

Neither St. John nor Dolf et al remedy the above-discussed deficiencies in Koz'min et al with regard to their melting method. Neither disclose or suggest the required presence of liquid or solid combustible elements, or mixtures thereof, in the mass of vitrifiable materials. Indeed, St. John deals exclusively with a refining step.

For all of the above reasons, it is respectfully requested that these rejections be withdrawn.

The rejection of Claims 73-75 under 35 U.S.C. § 102(b) as anticipated by U.S. 5,643,350 (Mason et al), is respectfully traversed. Mason et al disclose the use of molybdenum only for a water-cooled flange (column 6, lines 9-10) or for a removable pipe fitted to the interior of a wall of unspecified material (column 8, lines 35-37) in a nozzle assembly at the bottom of a waste vitrification melter, but not as a lining for the walls of a melting chamber made of refractory materials. Indeed, Mason et al do not disclose such a structure for the walls of the melting chamber. This is quite important when it is equipped with submerged burners. The strong convective movements within the glass bath are not good for the durability of the walls of the melting chamber, as explained in the specification. The use of walls combined with a cooling system so as to create a "colder", more quiet, zone near the walls and/or the metallic walls make it possible to use fully those very particular burners, without detrimental consequences on the longevity of the melting furnace itself.

The rejection of Claims 38-40, 42-45 and 78 under 35 U.S.C. § 102(b) as clearly anticipated by U.S. 5,615,626 (Floyd et al), is respectfully traversed. Floyd et al is concerned with processing of municipal and other wastes. Among the many types of waste disclosed (column 2, lines 31-51), none would appear to include the presently-recited vitrifiable

materials. During the above-referenced interview, the Examiner indicated that he believed that "slag" could be characterized as such. However, slag can be defined as the dross or scoria of a metal, i.e., the scum that forms on the surface of a molten metal, such as in the reduction of ores. There is no disclosure or suggestion in Floyd et al to treat the vitrifiable materials of the present claims.

In the Office Action, the Examiner finds that if the claims required the addition of combustible materials, which they clearly do, the claims would be anticipated by Floyd et al. However, Floyd et al do not anticipate or otherwise render the claims unpatentable for reasons above stated.

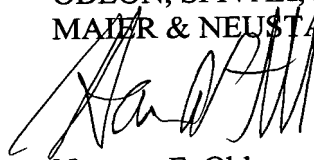
Applicants respectfully call the Examiner's attention to the Information Disclosure Statement (IDS) filed **herewith**. The Examiner is respectfully requested to initial the Form PTO 1449 submitted herewith, and include a copy thereof with the next Office communication.

Applicants gratefully acknowledge the Examiner's indication of allowability of the subject matter of Claims 66, 68, 69, 71, 92 and 95-97. Nevertheless, Applicants respectfully submit that all of the presently-pending claims in this application are now in immediate

condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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Amendment Filed on:

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IN THE CLAIMS

--38. (Amended) Process comprising supplying all or part of the thermal energy necessary for melting vitrifiable materials by injecting a combustible mixture comprising at least one fuel and at least one oxidizer gas, or gaseous products resulting from combustion of the combustible mixture, below the level of the mass of said vitrifiable materials, and melting said vitrifiable materials, wherein said vitrifiable materials comprise liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, [liquid combustible elements, solid combustible elements,] and mixtures thereof.

57. (Amended) Apparatus comprising:

at least one melting chamber equipped with burners which are fed with at least one natural gas fossil fuel and with an air or oxygen oxidizer, the said burners being placed so as to inject said fuel and oxidizer, or gases resulting from combustion of said fuel and oxidizer, below the level of the mass of vitrifiable materials introduced into said melting chamber; said vitrifiable materials comprising liquid or solid combustible elements, or mixtures thereof, and materials selected from the group consisting of batch materials, cullet, vitrifiable waste, [liquid combustible elements, solid combustible elements,] and mixtures thereof.

Claims 100-114 (New).--